

33082M0231

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Makoto OKABE, et al.

Serial No.: To Be Assigned

Art Unit : To Be Assigned

Filed: February 6, 2002

Examiner : To Be Assigned

For: VACUUM PROCESSING APPARATUS

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to or concurrent with calculation of the filing fees, please amend the above-identified application as follows.

IN THE SPECIFICATION:

Page 1, between the title and the heading "Background of the Invention" insert --The present application is a continuation of Serial No. 09/457,295, filed December 9, 1999, which prior application is incorporated herein by reference. - -

IN THE CLAIMS:

Please cancel claims 1-10 without prejudice.

Please add new claims 11-14 as set forth in the attached sheet entitled "NEW CLAIMS".

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REMARKS

Entry and consideration of this Preliminary Amendment are respectfully requested prior to examination on the merits.

This Preliminary Amendment is being filed to include a cross-reference to parent U.S. Patent Application Serial No. 09/457,295 filed December 9, 1999. This occurs on page 1 of the specification. It also is filed to introduce new claims 11-14 for prosecution in this continuation.

Examination on the merits is awaited.

Respectfully submitted,

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February 6, 2002

NEW CLAIMS

11. A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, said apparatus comprising:

- a processing vessel for applying the designated process to the object introduced thereinto;
- a susceptor located in the processing vessel for mounting the object thereon;
- a toroidal shaped vacuum pump including a motor therein for sucking exhaust gas from the processing vessel to form a vacuum in the vessel, the toroidal shaped vacuum pump being arranged below the processing vessel and being coaxial with the susceptor, the toroidal shaped vacuum pump defining a column-shaped space that is surrounded by the vacuum pump and that is located below the susceptor; and
- a driving mechanism arranged below the susceptor for moving the susceptor up and down, at least a part of the driving mechanism being received within the column-shaped space surrounded by the toroidal vacuum pump.

12. A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, said apparatus comprising:

- a processing vessel for applying the designated process to the object introduced thereinto;
- a susceptor located in the processing vessel for mounting the object thereon;
- a toroidal shaped vacuum pump for sucking exhaust gas from the processing vessel to form a vacuum in the vessel, the toroidal shaped vacuum pump being arranged below the processing vessel and being coaxial with the susceptor, the toroidal shaped vacuum pump defining a column-shaped space that is surrounded by the vacuum pump and that is located below the susceptor; and
- a driving mechanism arranged below the susceptor for moving the susceptor up and down, at least a part of the driving mechanism being received within the column-shaped space surrounded by the torodial vacuum pump.

13. A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, said apparatus comprising:

a processing vessel for applying the designated process to the object introduced thereinto;
a susceptor located in the processing vessel for mounting the object thereon;
an exhaust means for sucking exhaust gas from the processing vessel to form a vacuum in the vessel, the exhaust means being arranged below the processing vessel and being coaxial with the susceptor, the exhaust means defining a column-shaped space that is surrounded by the exhaust means and that is located below the susceptor; and

a driving mechanism arranged below the susceptor for moving the susceptor up and down, at least a part of the driving mechanism being received within the column-shaped space surrounded by the exhaust means.

14. A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, comprising:

a processing vessel for applying the designated process on the object introduced thereinto, the processing vessel being provided, therein, with a susceptor for mounting the object thereon;

a vacuum pump constructed cylindrically as a whole and arranged below the susceptor in the processing vessel so as to be coaxial with the processing vessel, for sucking exhaust gas in the processing vessel thereby to form a vacuum, the vacuum pump including:

a cylindrical inner housing arranged coaxially with the processing vessel,
a cylindrical motor stator arranged outside the cylindrical inner housing,
a number of rotors rotatably arranged with respect to the cylindrical motor stator,
a cylindrical inner housing arranged outside the rotors, and
a number of stators fixed to the cylindrical outer housing so as to each extend between the adjacent rotors; and

a driving mechanism arranged below the susceptor, for moving it up and down, wherein the vacuum pump is arranged around at least a portion of the driving mechanism coaxially therewith.